UM11972

BTS6306U Evaluation Board Quick Start Guide

Rev. 1.1 — 15 April 2024 User manual

1 Introduction

This document describes the use, design, and test results of the BTS6306U EVB.

1.1 BTS6306U product description

The BTS6306U is a wideband high linearity pre-driver amplifier with differential input for 5G massive MIMO infrastructure applications, with fast on-off switching to support TDD systems. The amplifier is designed to operate between 3.3 GHz and 4.2 GHz. The BTS6306U is housed in a 3 mm x 3 mm x 0.85 mm 16-terminal HVQFN package.

BTS6306U key features and benefits

- High saturated output power Po(sat) = 28.5 dBm
- High power-gain Gp = 38 dB
- High linearity performance ACLR better than -45 dBc
- Unconditionally stable
- Fast switching to support TDD systems
- 5 V single supply, quiescent current 100 mA
- Small 16-terminal leadless package 3 mm x 3 mm x 0.85 mm
- ESD protection on all terminals
- Moisture sensitivity level 1

1.1 BTS6306U product description...*continued*

Transparent top view

Figure 1. EVB board

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2 BTS6306U EVB properties

2.1 Schematic

DNP = not used components, reserved location. See Figure 1 for the location of the components.

Figure 2. EVB schematic

2.2 DC and control connections

Figure 3 shows the DC and enable connection, at the main header (J117). The connector can be straight or 90 degrees. The text is also on the EVB. Figure 4 shows connectors J118 GND, and J1 ISET. J1 (ISET) on the EVB has no functionality for BTS6306U and should be left open.

Figure 3. Main header J117

Figure 4. J118/J1

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2.3 Operations

Figure 5 shows the connections in a single ended to single ended operation. Figure 6 shows the connections on differential to single ended operation.

If only single ended to single ended operation is needed, NXP refers to UM11646 of the BTS6303U.

Figure 5. Single ended to single ended operation

Figure 6. differential to single ended operation

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3 Measurements results

In the below graphics, the Spar measurements are shown. Measured at nominal conditions V_{CC} = 5 V, $T_{case = 25}$ °C.

Figure 7. Differential gain at (typical values). V_{cc} = 5 V, P_i = -25 dBm

Figure 8. Differential RL_i (typical values). V_{cc} = 5 V, P_i = -25 dBm

Figure 9. RL_o (typical values). V_{cc} = 5 V, P_i = -25 dBm

Figure 10. K-factor (typical values). V_{cc} = 5 V, P_i = -25 dBm

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4 Abbreviations

Table 1. Abbreviations

Acronym	Description
ACLR	adjacent channel leakage ratio
ESD	electrostatic discharge
EVB	evaluation board
mMIMO	massive multiple-input multiple-output
RF	radio frequency
TDD	time-division duplexing

5 EMC information

CAUTION

This product has not undergone formal EMC assessment. It is the responsibility of the user to ensure that any finished assembly complies with applicable regulations on EMC interference. EMC testing, and other testing requirements for CE is the responsibility of the user.

6 Revision history

Table 2. Revision history

Document ID	Release date	Description
UM11972 Rev. 1.1	15 April 2024	• Updated Legal information and brought to current standard
UM11972 Rev. 1	8 September 2023	• Initial release of user manual

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